

**ADCA / MCA (III Year)**  
**Term-End Examination**  
**December, 2007**

**CS-13 : OPERATING SYSTEMS**

Time : 3 hours

Maximum Marks : 75

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**Note :** Question number 1 is **compulsory**. Answer any **three** questions from the rest.

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1. (a) Define deadlock with example. List the four necessary conditions for the deadlock occurrence. Also explain deadlock prevention methods. 8
- (b) Describe Belady's anomaly with an example. Does it occur in all page replacement algorithms ? 7
- (c) Explain Producers/Consumers problem in concurrent programming, with an example. 5
- (d) Define the terms mutual exclusion and semaphores with examples. 5
- (e) What is thrashing ? Explain its causes. Give examples. 5

2. (a) Explain Ricart and Agarwala's Algorithm for ordering of events in distributed operating system environment. 7
- (b) If memory access time is 250 nsec; search time in TLB is 25 nsec; hit ratio is 80%; calculate effective memory access time. 3
- (c) Write the types of multiprocessor OS. 5

3. (a) For the following processes and CPU burst time  
*(Note : All the processes arrived at the same time)*

<u>Processes</u>	<u>Burst time</u>
P1	1
P2	4
P3	3
P4	2

- (i) Draw Gantt charts showing the execution of processes for
- (a) SJF
- (b) Round Robin Scheduling (quantum = 1)
- (ii) Calculate the waiting time and turnaround time of each process for above scheduling algorithms. 6
- (b) Explain Dekker's solution to mutual exclusion problem, with an example. 6
- (c) Explain Access-matrix model for protection, with an example. 3

4. (a) Explain the concept of paged segmentation. What are its overheads ? 5
- (b) List and explain the disk allocation methods in an operating system. 5
- (c) Explain take-grant model for protection of a system. 5
5. (a) List the similarity and differences between multiprocessor and distributed systems. 5
- (b) Explain the concept of working set model with an example. 5
- (c) Explain single-stage and multi-stage interconnection networks with examples. 5

